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SCIENTIFIC AFFAIRS

No. 669

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RESEARCH, IMPLEMENTATION AT PETROLEUM, NATURAL GAS RESEARCH INSTITUTE

Budapest KEMIAI KOZLEMENYEK in Hungarian Nos 3-4,1979,pp 259-271

[Article by director Rezso Csikos: "Research Results of the 30-Year Old Hungarian Petroleum and Experimental Natural Gas Institute, and Their Practical Implementation"*]

[Text] In 1978 it will have been 30 years that our Institute was founded. At Dr Mihaly Freund's proposal the Chief Economic Council decided to create the first domestic independent industrial research institute in 1948, the Hungarian Petroleum and Experimental Natural Gas Institute, or MAFKI by its abbreviated [sic] name, and he was assigned to organize and head it.

Starting the research work required the solution of many problems. The personnel and objective conditions for starting the research work had to be created with careful circumspect organization. Defining the research topics to begin the Institute required particularly great knowledge. Added to all this were the handling of tasks connected with building the headquarters building and commencement of the construction.

As seen in Figure 1, from the first spadeful of dirt turned over to this day conditions have improved considerably and today various jobs connected with research are being conducted in three locations, in Veszprem, Budapest and Pet.

In Figures 2 and 3 I show the Veszprem headquarters building and part of the experimental facility in Pet. Modern laboratories, instruments and pilot plant equipment, a good library and documentation insure that the tasks are solved on high standards.

The start and selection of topics were successful after founding. Barely a few years later useful scientific results already appeared for the industry, such as for example the results concerning the refining of solvents, manufacturing technology of bitumens, and some large petrochemical technologies. Among these without trying to give a complete list I will mention the partial oxidation of methane and working out the production of acetone from the acetylene produced, which results are finding implementation (2,000 tons of acetylene per year) in Buciumeni, Rumania within the framework of an international agreement. This contract also contains the feature whereby Rumania will provide Hungary with 200 million cubic meters of natural gas per year for 25 years. This was important at the time when the major domestic petro-chemical industry had its beginnings. Successful results also came about in the areas of deparaffination by carbamide, gas separation using hypersorption, then of one-step oxosynthesis. The research projects needed for processing the petroleum discovered in Nagylengyel and the questions concerning bitumen production must be mentioned separately. The research results achieved in this area all contributed to the domestic users receiving excellent quality bitumen from Nagylengyel petroleum and significant quantities have also been exported to the West.

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*Lecture presented on 22 May 1979 at the festive reading recital session of the Department of Chemical Sciences of the Hungarian Academy of Sciences [MTA] on the occasion of academician Mihaly Freund's 90th birthday.

Over more than 30 years the Institute has grown significantly, and a capable research team has been trained. In the meanwhile numerous capable experts have left the Institute for jobs in the areas of education or industry where their professional training was needed. The profile of the Institute's research topics has been changed also, shaped by external and domestic circumstances. Changes in economic policy, and in part the ideology of the leadership have forced the Institute to define its research areas even more efficiently, with greater goal-orientation to solve problems and to also strive to find practical applications for the research results. The present topic structure developed due to the influence of this progress; in Table 1 I show its outline. It can be seen in this table that all those research policy ideas which in the last 10 years concerned selectivity and efficiency can be found in the Institute's constantly changing topic structure. It can also be seen from the table that the Institute has implemented an extremely selective research policy on a relatively broad research basis. This broad research basis is justified by the fact that Hungary is a small country with small resources. Within the main topic areas it works on only a few of the 100 or more problems belonging to the topic area, the ones in which industry shows an interest and in connection with which scientific and practical results can be achieved. Ninety percent of the Institute's research activity is concentrated on the 25 topics shown in the table. Our research results achieved in the topics indicated in the table with italics are among the forefront in the world in this area. In connection with the other topics also the characteristics are newness and scientific results, but these are planned in accordance with the domestic needs. There is no opportunity here to introduce all of the topics, therefore I will report only briefly on some of the topics and on the results achieved.

Table 1. The Institute's Research Program

Petroleum and Natural Gas Processing	Petroleum Chemistry	Organic Synthesis	Environmental Protection
Lubricating oils	MTBE	Lube oil additives	Separation of oil from water
Bitumen production	Petroleum-sulphonate	Orthophenylene diamine	Freeing air of organic matter
Industrial oils	Insulating materials	Production of multi-ring aromatics	Solid waste decontamination
Gas processing	Thermal decomposition of hydrocarbons		
Gas applications			Development of evaluation methods and instruments
Hydrocarbon emulsions	Catalyst research		
Research activities relevant to all topics			
analysis	operations	computer technology	planning

Ever since the beginning lubricating oil development of and the scientific activity connected with the synthesis of additives represented an important area among the Institute's research projects. Besides the various laboratory apparatus an experimental engine station suitable for evaluating the lubricating oil and the additives also had to be established. Separating this research area from the others, I would like to show the results of research done from 1952 to the present in Table 2. Table 2 shows all those lubricating oils and additives which the Institute's researchers developed and introduced in the last 26 years in cooperation with industry's experts.

Table 2. Actual Additives and Lubricating Oils Developed at the MAFKI

Producing firm	1952	1956	1968	1978
	Lardoline	Industrial Chemicals Factory	EMV*	Nitrochemical Industrial Plants
Additive identification	M/A 4-1	M-120	M-201 M-267 M-182	M-250 M-201 M-400 ME-1
Quantity, tons per year	200	600	2,600	4,000
Motor oil designation	--	DAX MDX	MMa MDA	MDC
Oil change frequency, km	1,500	2,000	4,500	10,000
Savings, million Fts/year	--	--	90	180 to 230

In connection with bitumen production in Table 1 I would like to mention that the Institute developed a new oxidation process with the aid of which good quality bitumens can be produced. The process was implemented by a plant with a 5[illegible],000 ton capacity per year in Szazhalombatta shown in Figure 4.

Compared with the earlier processes twice as high capacity can be achieved with the new, higher efficiency reactor, while its energy consumption is 30, and its product quality is 15 percent more favorable. Based on our license and our know-how the Hungarian People's Republic will send complete plant with a 535,000 ton per year capacity to the Polish People's Republic. It will begin production in 1980.

In the area of industrial oils the production of oils for high capacity transformers began last year with 2,000 ton capacity per year. We developed this jointly with the Komarom Petroleum Industry Enterprise and the newly produced oil completely fulfills Western specification requirements with respect to both, oxidation stability and gas stability. Based on several years of practical experience thus far, the new oil insures at least a doubled lifespan.

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*[Northern Hungary Chemical Works]

In the areas of gas processing and gas use applications, we are dealing with the distribution questions of produced natural gas and with the application area, partially at the behest of the gas producing and partially by the gas service enterprises. A process is being developed by the Institute to enable the municipal gas service system to use natural gas in the capital city and in Dunaujvaros.

Research connected with hydrocarbon emulsion is barely 2 years old at the Institute. Its essence energy savings can be achieved by using hydrocarbon emulsions and also a decrease of environmental pollution, and other performance improvements. The important thing is that 10 to 15 percent water must be distributed in a very fine dispersion in the diesel fuel or in heating fuel. In this area significant research is being done primarily in the USA and in Japan. Stability of the produced emulsion and working out the detail problems associated with its use represent the main problems. During the course of our research thus far we have succeeded in producing such an auxiliary chemical material with which we can uniformly distribute 7 to 10 percent water in diesel fuel in such a way that the system is stable even after 2 months, does not separate.

Our Institute was among the first in the world to begin work on producing methyl-tertiary butyl-ether (MTBE) from raw C_4 fraction and to use the material as a component to improve gasoline quality. Within the area we have solved two large problem areas. One of them is related to the material's synthesis, developing the technology, and the other represented fitting this into and using it in the production technology of gasoline.

We have just completed furnishing the design data for a 27,000 tons per year capacity plant and building the MTBE plant is part of the next 5-year plan. Cooperating with the Soviet Union's Central Petroleum Industry and Petro-chemical Scientific Research Institute in the area of application we have determined the characteristic effect on the various gasoline distillates and gasoline types; proved with large-scale operating experiments that the new component besides improving the quality not only decreases the lead content from the environmental protection viewpoint but by using it the carbon monoxide and harmful hydrocarbon content can also be decreased in the exhaust gases. Also, in the so-called "stop-and-go" operating mode in city driving gasolines made with methyl-tertiary butyl-ether show 6 to 7 percent fuel savings.

Results related to the comprehensive processing of pyrolysis oil. With the spreading of pyrolysis plants significant quantities of hot liquid byproducts over 170°C are being generated for the processing of which we developed a process which is new even in world-wide respects. Processing of the generated pyrolysis oil is very difficult because of the unstable products and cannot be done by the usual methods, therefore we developed a thermal oxidation process with the aid of which the material system can be processed and can be transformed into a product suitable for further processing and one valuable for the chemical industry. We installed the technology in an experimental plant with a 8,000 ton per year capacity, shown in Figure 5. Based on the data gained here we have provided technology and furnished data for the design of a plant with a 70,000 ton per year capacity.

The comprehensive processing research continues and the task is to also develop a technology for using the generated product in the chemical industry.

The next topic in Table 1 is petroleum sulphonate. In recent years it has become general practice--besides other processes--to extract 60 to 65 percent of the reported petroleum inventory instead of the earlier 35 to 40 percent by injecting a so-called micellary solution into the majority of the located oil fields with the aid of petroleum sulphonates. Petroleum sulphonates can be produced relatively inexpensively and in large quantities from raw materials found in Hungary. Our Institute built and operates continuously working equipment with a 5 kg per hour capacity. Based on the favorable data gathered thus far, we provided technological data for the construction of a 10,000 ton per year capacity experimental production plant.

In connection with the development of insulating materials in the last 7 years the Institute began to develop an insulating material family based on petrochemicals. Jointly with the Hungarian Plastic Material Processing Enterprise we introduced the system which is suitable for insulating long distance petroleum and natural gas lines, and today production is continuous. The Graboplast Enterprise is setting up to produce bitumen-containing PVC, further development of the product for insulating bridges is now in progress, accompanied by solving the tasks of finding the optimum application technology.

Introduction of an insulating material system reinforced with split polypropylene has in part been completed at the Kemikal Construction Material Industry Enterprise, and in part a production line is under construction. The material insures modern insulation for public facilities, underground metal equipment and installations in the construction industry. On Figure 6 I show the insulation work done at the Paks Nuclear Power Plant.

We have worked out manufacturing technology for the intermediate ortho-phenylene-diamine, where starting out with para-dichlorobenzol, ortho-phenylene-diamine can selectively be produced. We have also used this technology in large-scale laboratory equipment and provided design data for the preparation of plans for an experimental plant. Practically only the desired product is formed. Yield as well as conversion are very favorable.

We developed a process for the synthesis of piperonyl-butoxide used as synergetic in plant protecting chemicals. Starting out with safrole we do hydrogenation, chloromethylation and coupling with butyldiglycol, then we separate the desired product from the byproducts in firm distillation equipment operating under 1 to 2 mbars of pressure. At our experimental facility in Pet we built a 150 ton per year capacity pilot plant to start production. A section of this can be seen on Figure 7.

In the area of environmental protection research projects, the first large area of separation of oil from water. To solve this problem our Institute worked out a method with the help of which 90 to 95 percent of the oil and sediment content found in petroleum industry and chemical industry waters can be removed. It essentially uses the principle of air lift whereby favorable contact between the air introduced and the water to be purified is insured. Compared to other processes in floating the oil to the surface and precipitating the sediment with relatively small energy expenditures is achieved. Favorable mixing and oxygen intake through the air insure the process's efficiency. We implemented the first large industrial process at the Danubian Petroleum Industry Enterprise for equipment with a 800 cubic meters per hour capacity. We have also worked out the application of this principle for smaller water users. The 5, 10, 15 and 25 cubic meter per hour capacity purification lines developed by the Institute can be used primarily at the AFIT [Industrial Trust for Auto Maintenance] and VOLAN [Transportation Enterprise Service] facilities to remove oil and sediment from water. Some of this equipment is in operation today in Berlin, Karl-Marx-Stadt, Budapest, Szeged and in Nagykanizsa. Nine more similar purification lines are under construction. As a further refined variation of the process equipment with a 800 cubic meters per hour water throuhput suitable for biological purification is also under construction.

Our thermal-catalytic process developed for decreasing the organic material content of air and for purification of technological exhaust gases was implemented in Dorog with a 15,000 M^3/h capacity, where we are using a catalyst with metal content applied with a carrier. The plant has been operating trouble free for 2 years.

A catalytic exhaust-gas purifying plant was built at the Zalaegerszeg Petroleum Industrial Enterprise where each hour 20,000 cubic meters of technological exhaust fumes are purified using a non-agent metal oxide catalyzer developed by the Institute. There are only traces of organic materials, carbon monoxide and hydrogen sulphide in the gases leaving the plant's section shown on Figure 8. The exhaust gas contains no materials harmful to health or causing cancer. Based on data and technology supplied by the Institute, Hungary will ship to the Polish People's Republic a 30,000 cubic meter per hour capacity plant and catalyzer.

Pilot plant experiments are in progress within the framework of a process developed in the laboratory to decontaminate solid and liquid wastes. A large-scale industrial implementation study is in progress for embedding in bitumen and subsequently burying low radiation intensity materials generated in nuclear power plants. Development of a similar process is also in progress for the burial of industrial chemical poisons, contaminated plant protecting chemicals, etc. To satisfy the needs connected with defining the environmental protection tasks and pollution, the Institute has developed new investigative methods and investigative tools. We developed portable equipment such as the CARBODET to determine organic contamination, SULPHODET to determine sulphur pollution, THIODET to detect the odor effects of gases; the equipment named CARBOREG, SULPHOREG and THIOREG, respectively, are the permanently installed variations of these.

Two types of research are underway in connection with catalytic research projects: on the one hand we examine and grade the quality of imported catalysts. On the other hand we developed new catalysts. For example the production of two catalysts for environmental protection purposes has begun at the Kobanya Porcelain Factory.

Besides research and the implementation of topics listed the Institute's publishing activity is also significant. By 1978 more than 2,000 articles and lectures were published and delivered by the Institute's personnel. The Institute has obtained 250 foreign and domestic patents. Our workers have written 10 books. Volume 18 of the annually published MAFKI KOZLEMENYEK [MAFKI Reports] is being published. MAFKI workers are active at the various domestic and international conferences and on the various committees of the Hungarian Academy of Sciences and of the Association of Hungarian Chemists.

Last year the Ministry of Heavy Industry performed a comprehensive and complex investigation of our Institute. According to the report's conclusions prepared, each forint spent on research at the Institute produces 3.4 forints worth of results. Of course this number contains only the results of processes for which records can be kept: mainly the patented ones.

All these things verify the conclusion that science has become a direct productive power, definitively illustrated today by our Institute. What made all this possible is that over 30 years ago a decision was born to establish and organize our Institute. All those results on which I provided a brief report were achieved by growing on the foundations initiated then. We hope that our future work will be similarly successful and that we will receive all the support which, coupled with the Institute's creative ability will insure additional results for the national economy and will contribute to modernization of the product structure and increasing the level of technology.

[Figure 1. The first spadeful of dirt turned by Mihaly Freund when the Institute was founded.]

[Figure 2. The Institute's headquarters building in Veszprem.]

[Figure 3. The experimental facility in Pet.]

[Figure 4. The traditional bitumen oxidizing reactor and the one developed by the Institute, next to each other.]

[Figure 5. Experimental plant with a 8,000 ton per year capacity for the processing of pyrolysis oil.]

[Figure 6. Insulation work at the Paks Nuclear Power Plant.]

[Figure 7. Part of the plant making piperonyl-butoxide.]

[Figure 8. Exhaust gas purification unit operating on the basis of the MAFKI process in the bitumen oxidation plant under construction.]

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USE OF GRAPHIC COMPUTER METHODS IN DESIGN OF IC'S

Budapest MERES ES AUTOMATIKA in Hungarian Vol 28 No 1, 1980 pp 13-16

[Article by Dr Vladimir Szekely, candidate of technical sciences, Pal Baji, and Maria Pencz (Mrs Kerecsen), Department of Electronic Devices, BME [Budapest Technical University]

[Text] Matters concerning the organization of design programs with the aid of graphic and interactive methods has been the subject of studies at the Department of Electronic Devices of Budapest Technical University for a long time within the framework of a project on automated engineering designing. This article reports about the achievements in this field. The interactive graphic design programs TRANZ-TRAN 3/D, TERMANAL-DC, VEKONYIC, and VASTAGIC are illustrated by means of display photographs.

With computers featuring better performance and new achievements in the field of algorithm preparation, the possible assistance that computers could render to designers is of very great interest. Yet, we note that computer-assisted techniques have not been implemented widely in Hungarian engineering practice. The reason for this is definitely not the lack of equipment. As a matter of fact, some areas, such as public administration, which are usually regarded as more backward than engineering areas, seem to show higher-level computerization in Hungary, computers being used in a larger percentage of their work.

Basically, in our opinion, the principal factor is the establishment of the manner in which the computers are used, namely the interaction between computer and the human operator. Whereas most administrative tasks can be successfully performed by means of "batch processing," which was the standard method during the first few decades of the computer-technology era, using conventional organization and peripheral devices, engineering design usually requires interactive computer-human relations and often also special peripheral devices (such as devices capable of preparing illustrations and drawings). Such devices are not yet commonplace. In addition, the mathematical problems of data processing seldom seem to be more complex than the four basic mathematical operations; at the same time, the solution of many algorithm problems used in engineering design appear to require several decades of study.

The Role of Training

We cannot truthfully say that the training given in our technical universities has successfully dealt with this problem, one which affects engineering in all its ramifications. We have included in our curricula the fundamentals of programming in the ALGOL and sometimes also in the FORTRAN language, as well as general courses on numerical methods. Dr Kalman Tarnay and Dr Vladimir Szekely at the Department of Electronic Devices of BME have performed with some success already about ten years ago in achieving that these subjects become part of our overall training program. Today we still believe that this is useful, provided that they contribute toward the professional culture of our students. Nonetheless, we must realize that these computer-technology subjects cannot be used directly in engineering practice (or have only limited use). If and when an engineer today uses computer technology in his work, he definitely does not use it in the manner in which he was taught in these courses.

How could we utilize computer technology in engineering designing in an effective and economical manner? We know already that the way is not for every engineer to write his "very own little program" for the task facing him. The practicable way is to prepare universal programs for the design tasks that regularly face us. We need to optimize not only the algorithms, accuracy, and running time of these programs; we must give equal attention to the computer-human relationship, ergonomical designing. The use of these programs usually requires no special knowledge (such as knowledge of programming) beyond the fundamentals of computer technology. This trend imposes new requirements for engineering training. We must impart to our students not only general knowledge of computer technology but also information about the use of engineering designing programs. We must show them the range of existing programs, and must make at least some available to them, so that they become familiar with their use. This task is properly the duty of the specialized university departments.

Automated Engineering Designing (AMT) and Graphic-Interactive Methods

The development trend of the AMT programs imposes specific demands on those who develop such programs. It is not enough if they concentrate their efforts on the algorithms of the programs they develop. The use characteristics must also be painstakingly developed, preferably so that the format matches the specific problems well and that the use of the program becomes attractive to the potential user.

At the Department of Electronic Devices, we have investigated automated engineering designing for a long time within the framework of an overall project, and have examined matters concerning the interactive and graphic organization of the designing programs. It should be noted that this approach is particularly important in connection with the designing of integrated circuits. First because the designing of the IC masks requires primarily operations involving geometric configurations, and second because the results of the individual phases of the designing process can be very clearly displayed graphically. Also, many of the steps of the designing process require interactivity.

In cooperation with the REMIX Radio-Engineering Enterprise, our department has prepared over the years the software of a graphic-interactive IC-designing system. Three programs of this system are of particular interest for our subject:

- TRANZ-TRAN 3/D, a nonlinear circuit-simulation program [1] with graphic display input and output, with the interactive services required for circuit designing;

- VEKONYIC-VASTAGIC, a display-type interactive program for realization and mask-designing of thick- and thin-layer integrated circuits [2];

- TERMANAL, a graphic interactive program for the computation of the temperature distribution of IC boards.

All three programs run on a TPAi computer, using the 180 by 240 matrix display of the KFKI [Central Physics Research Institute] for graphic display. The GAS (basic graphic software) and GS (graphic software) program packets, performing the graphic functions of the system, were developed at our department, and in defining the subroutine packet for two graphic methods we already considered the problem of graphic interactive designing as a major factor.

Practical Aspects of the Graphic Interactive Designing Programs

Finite Picture Size and Resolution

The picture to be displayed is "too large" for the screen; if we reduce the size we lose detail. This problem arises even with vector displays of high resolution; in the case of a grid display with a 180 by 240 point matrix we encountered it in practically every display task.

We solved this problem by making use of a generally used method from display engineering. Instead of the full picture, we show only part on the screen, something like looking out through a window. Behind the "window," the designer may enlarge or reduce the size of the picture, and may study any desired detail of it. Most of the "window functions" are provided by the GAS-GS basic software, already in existence. For the programs it permits drawing on a virtual picture field with 1048 by 2048 points, and a single command specifies the required part of the picture. In developing these "window functions" we took cognizance of the fact that the interactive operations often require the display of one or two lines of text, which cannot clash with the illustration on the screen. Thus, the graphic window, displaying part of the virtual picture, is somewhat smaller than the full screen area (Fig. 1), and the field under the window is reserved for textual information (alphanumeric field).

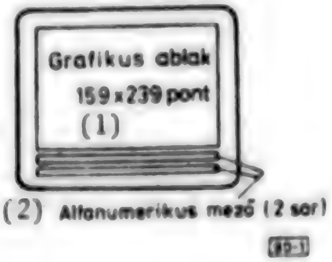

Fig. 1. Display screen with the graphic window.
Two lines for text are underneath.
Key: 1. Graphic window, 159 by 239 points
2. Alphanumeric field, two lines

Display of the Results on the Screen

We took two factors into consideration in the preparation of the result-display segments of our programs:

- to utilize the potentialities of the visual-graphic display technique;
- to ensure that the method of display conforms to the engineering practice.

Let us see how this looks in the result displaying of the circuit simulation program, for example. After completion of the d.c. analysis, the sketch of the circuit appears on the screen (Fig. 2). A framed field is visible in the right bottom corner. The latter plays the role of a digital-voltmeter display; the voltage of the nodal point pointed out in the circuit is shown in the field. (To permit this "pointing" to be accomplished, the display has a pointer with the aid of which the cursor—a light mark—may be moved to any desired part of the screen.) The final results in transient analysis are voltage-time functions. This function now appears on the screen (Fig. 3) for the nodal point of the circuit pointed out by the cursor. It is as if the signal shape would be examined on an oscilloscope. Parts of the function curve may also be observed in magnification. There are also means for superimposing several functions for simultaneous examination—like with a multichannel oscilloscope.

[Photo not reproduced]

Fig. 2. After the d.c. analysis of the TRANZ-TRAN 3/DC, the display screen shows the diagram of the analyzed circuit; the nodal-point voltages may be interrogated with the aid of the cursor.

[Photo not reproduced]

Fig. 3. The voltage-time functions of the requested nodel points appear on the screen after the transient analysis of the TRANZ-TRAN 3/D. The time-voltage values may be read from the XY coordinates of the movable cursor.

In displaying the function diagrams we found that drawing of coordinate axes with numerical scale was impossible because of the low degree of resolution. The cursor mark may be used to ensure that the function diagrams are quantified. While the function is displayed,we see two numbers in a frame in the bottom right corner of the display (Fig. 3). The numbers represent the coordinates for the momentary cursor position. Thus, the data of any point of the function may be interrogated with the aid of the cursor. The method was found to be accurate and convenient for the user; in our opinion this is the best solution even if the display has a high resolution.

The TERMANAL program, which computes the temperature distribution of the integrated circuit board, imposed special demands on result display. The information to be displayed here is the two-dimensional temperature distribution of the integrated circuit. One method we selected for displaying the results was the plotting of isothermal curves. The picture on the screen looks like a relief map (Fig. 4), showing clearly the temperature distribution of the circuit. Often the result display must also be used for documentation purposes. A hard copy may be required. The optimum way for obtaining this would be the use of a hardware device (such as a matrix printer) which records the grid display directly on paper. But since we had no such device, we equipped the TERMANAL program with a hard-copy preparation segment for printout of the temperature distribution on a digital plotter.

[Photo not reproduced]

Fig. 4. The TERMANAL DC program displays on the screen the IC device analyzed and the temperature level diagram. The temperature of the point marked by the cursor appears in the framed field.

Graphic Display and Interactivity

The screen, functioning as a drawing board with special performance features, assists in the designing of thin- and thick-layer integrated circuits. The drawing sections displayed may be, for example, shifted or rotated. All these are interactive procedures. We may move the cursor to the desired point of the drawing section, and we enter the desired rotation via the keyboard. In this manner we establish the layout of the integrated circuit, component by component (Fig. 5). The individual components may be relocated. While these procedures are underway, we may change the magnification of the picture, and if we deal with a two-sided circuit we may "turn the board over" so as to examine the opposite side.

Circuit entry and modification is an interesting graphic-interactive service of the circuit-simulation program. Here, the designer draws the circuit on the screen to inform the computer. He designates the location of the components with the cursor. The program asks for information about the type, ratings, and the like of the component concerned. This is how the sketch illustrated in Fig. 2 was obtained. Any component may be deleted or modified, not only during the initial entry but also before each partial analysis.

[Photo not reproduced]

Fig. 5. The designed IC is displayed on the screen as the result of the VEKONYIC and VASTAGIC designing programs.

Ergonomic Problems

In interactive programs we must be prepared for the fact that a fraction of the user interventions may be erroneous. The goal is to ensure that this does not interfere with, and if possible not even slow down, the useful application of the program.

The following are conditions for this:

- The computer should signalize at once any recognizable user errors;
- After signalization, easy correction of the error should be possible.

We often employed the following approach: A flashing question mark appears on the screen for a brief time, after which the program restarts the incorrectly executed user step.

Response Times of the Computer

Our goal must be to ensure that the computer should not delay more than a few seconds during the interaction between it and the human user. If this is not the case, the dialog is unpleasantly interrupted. In cases, however, where this is unavoidable, for example in network analysis where the computation time is several minutes or even as much as 10 minutes, the preparers of the display interactive programs must remember the golden rule [3]: There is "panic" before the screen if

- We do not know whether anything is going on;
- We do not know how long it would take for whatever is going on.

Thus, while the computer computes for more than one or two seconds, the screen must not be dark. As a matter of fact, even a stationary picture will not suffice. The display must be "alive" so as to reassure the designer that the computer works and did not stop. If the computation process is lengthy, a continuous status report of the process may be desirable.

In our opinion, our goal should be in computer programs for engineering designing to provide interactive structure and visual-graphic information exchange. Our article described our experience, problems, and accomplishments along this line. The hardware potentials exist, and the graphic display approach is spreading. We hope that this will stimulate the implementation of the AMT programs.

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DESIGN AND REALIZATION OF A MICROCOMPUTER REAL-TIME MONITOR

Budapest MERES ES AUTOMATIKA in Hungarian Vol 28 No 1, 1980 pp 21-24

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[Abstract] The microcomputer real-time monitor was designed for 1 A high degree of portability at the definition level; 2 Simple, modular construction; 3 Provision of synchronization to events and resource; 4 Relatively small memory requirement; and 5 Self-initializing organization. The monitor consists of the monitor core (modules for initialization, timing, event handling, and scheduling), the data tables, and monitor requests. The task states are: outside of running, action, run and wait. The tasks request monitor services for changing task status (calling and ending), event handling (indicating, waiting for, waiting for a specified period, and clearing of events), masking of interrupts (enable and prohibition), and elementary input/output operations (reading and writing). The central memory contains a readout memory accomodating the programs and constant data tables, and a random access memory, the content of which changes as the program is executed. The monitor was realized on the basis of an Intel 8080 microprocessor, the RTM-80 real-time monitor, and tests were also conducted in order to determine the suitability of an LSI-11 microprocessor. The monitor does not contain computer-dependent components, and can be used with good efficiency for existing microcomputers or those under development. The use of the monitor contributes to the uniformization of user programs. Figures 5; tables 1; references 6: 1 Hungarian; 5 Western.

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POLAND

POLISH ACADEMY OF SCIENCE PERSONNEL, ACTIVITIES

Warsaw NAUKA POLSKA in Polish No 8, Aug 79 pp 97-137

[Articles: "From Polish Scientific Activity"]

[Excerpts] Share of Science in Socioeconomic Development

A Polish-Soviet symposium, organized by the Ministry of Science, Higher Education and Technology, was held in the University of Warsaw on 14-16 May 1979. Its purpose was the exchange of ideas and experience on the topic of increasing the role of science in socioeconomic development and improved application of research results in practice. Taking part in the discussions were outstanding scientists and government workers. Present, among others, were a member of the Political Bureau of the PZPR Central Committee, Deputy Chairman Mieczyslaw Jagielski, and the USSR Deputy Chairman and Chairman of the USSR State Committee of the Council of Ministers for Matters of Science and Technology, Vladimir Kirillin, as well as the USSR ambassador to Poland, Boris Aristov.

The rector of UW [University of Warsaw], Zygmunt Rybicki, greeted the participants, and Janusz Gorski, the minister of Science, Higher Education and Technology, gave the address opening the discussions.

In his speech Deputy Chairman Jagielski presented the directions of scientific policy in Poland and the role attributed to science in connection with the building of a developed socialist society in our country. V. Kirillin presented the achievements of the Soviet Union in the scientific research development of the country and current problems associated with the effective use of scientific research. Following this there were approximately 30 reports on the subject of problems connected with the development of science and technology, and their connections with industry and economic practice in various contexts.

The authors of the basic reports were: PAN [Polish Academy of Sciences] corresponding member Jozef Pajestka, who dedicated his report to the factors of technological progress in the economy; Aleksander Tselikov, a regular member of the USSR Academy of Sciences, spoke on organizational conditions favoring the rapid application of the results of scientific research; PAN corresponding member Adam Gierek devoted his report to the problems of innovation in the field of materials engineering; a deputy of the chairman of the USRR [Ukrainian Soviet Socialist Republic], Ivan Kochevikh, reported on the problems of economic use of fuels and energy and on the possibilities offered by science in this area; the scientific secretary, PAN regular member Jan Kaczmarek, spoke on the role of scientists in the scientific and technological development of the national economy, especially in the field of basic research; a regular member of the USSR Academy of Sciences, Dmitriy Zimerin, emphasized among other things in his report the significance of the development of computer technology in the national economy; PAN regular member Ignacy Malecki explained the role of basic research in the progress of technology; the first deputy of the chairman of the USSR State Committee on Matters of the Minas Chentemirov construction elaborated on the directions of scientific and technological progress in Soviet construction.

In addition the organization of research and developmental work and the role of the research and development base in introducing innovations was spoken of in reports and discussions. Problems associated with the collaboration of scientific and of research and development laboratories with economic organizations were examined, and the organizational and technological conditions of using scientific research were discussed.

The symposium, organized on the initiative of the Polish party, became an important link in the developing scientific and technological cooperation between Poland and the USSR. The fruits of this meeting were many conclusions and proposals concerning further cooperation, and an exchange of ideas and experience between the two countries.

In summing up the accomplishments of the symposium, Minister Janusz Gorski stated that introducing technological and organization progress into practice and making it general is one of the sources of the socioeconomic development of both Poland and the Soviet Union. In both countries the most important factors of economic growth are improvement in the quality of production, raising the technological level and increasing work productivity. The discussions showed how beneficial mutual cooperation between the scientists and specialists of Poland and the USSR is. Among other things it was found that an integral element in technological and scientific cooperation between the two countries should be improvement in the processes of application and an increase in the effectiveness of science.

International Economic Cooperation

A seminar of the UN European Economic Commission on the subject of the "Forms and Directions of International Economic Cooperation" took place in Warsaw on 15-18 May 1979. Some 130 representatives and observers from 21 countries and 3 specialized UN organizations participated in it, along with representatives from organs of CEMA, EEC and GATT.

A major subject of the discussions, organized by the "Poland 2000" Committee on Research and Prognoses of the PAN Presidium and the Institute of Trends and Prices in Foreign Trade, was a search for opportunities of developing international economic cooperation which would create conditions for optimal and long-term economic growth in the individual countries.

Problems of Environmental Protection

The Third Scientific Symposium on the subject of comprehensive research and water pollution control, organized by the Division of Local Economy and Protection of the Environment of the Voivodship Office, the SZSP [Socialist Union of Polish Students] and the "Arius" Academic Club of Basic Research, existing under ATR [expansion unknown] in Bydgoszcz, was held in Karolewo kolo Koronowa on 4-5 May 1979.

Participating in the symposium were representatives of interested institutions, such as: the Institute for Environmental Formation, the Nicholas Copernicus University in Torun, the League for the Protection of Nature, "SANEPID," the Voivodship Nature Conservator, the Polish Anglers' Union, fishing PGR [State Farms] and various departments of the Bydgoszcz Educational Institution.

The reports delivered concerned problems of water purity in this region, research methods, defense and protection of natural water reservoirs and so forth.

On the occasion of the symposium an exhibit called "Protection of and Research on the Water Environment" was organized.

On 24-25 May 1979 approximately 200 specialists from various national and international scientific centers, institutes and laboratories participated in Lodz in an international symposium dedicated to the problems of gas pollutants in the air in light industry.

Among others one purpose of the discussion was to recognize already existing solutions in the area of preventing and eliminating gas pollutants in our country and comparing the state of research in other countries of Europe, such as the USSR, Hungary, Romania, the GDR and the FRG. During the discussions effective directions of activity in the light industry in the area of limiting the harmfulness of manufacturing processes and of preparing technology to enable maximal protection of the natural environment of man were brought up.

On 8 June 1979 a symposium on the subject of "Economy in Rural Areas and Environmental Protection," organized by the Commission for the Protection of the Environment of Man in the Industrial Regions under the PAN Branch in Katowice, the Scientific and Technical Association of Agricultural Engineers and Technicians of the Branch in Opole, and the Voivodship Center for Scientific, Technological and Economic Information of the Voivodship Office, was held in Opole.

The contents of the reports included the problems threatening the environment, beginning with industrialized animal fattening farms and ending with the chemical control of weeds and plant pests, as well as the problems of territorial development of the environment, which, as was emphasized in the discussions, cannot serve exclusively for emergency purposes stemming from periodic situations, but must form beneficial conditions for the life of future generations.

A symposium, organized by the PAN Institute of Geography and Territorial Development and the Voivodship Office in Suwalki, was held on 6-7 June 1979 in Wigre (Suwalki Voivodship). The talks included participants representing scientific institutions in the European CEMA countries (except Romania) and Yugoslavia, jointly implementing a 5-year program of research in the field of environmental protection.

The basis for the discussions was the results of research in areas least polluted by industrial activity, and with outstanding recreational and rest functions, so-called model areas, which include the Suwalki region, along with others. They presented the results of research up to now, prepared in a preliminary scientific synthesis and set research plans to the end of 1980.

In Minsk Mazowiecki, on 26 June 1979, was held the First Voivodship Scientific and Technological Conference on the subject of the "Major Problems in Environmental Protection in the Siedlce Voivodship," organized by the Department of Local Economy and Environmental Protection of the Voivodship Office in Siedlce and the Council of the Voivodship Branch of NOT [Chief Technical Organization].

Some 80 persons took part in the conference, representing industrial plants and local administration units. The reports, prepared by scientific workers from the Higher School of Agriculture and Pedagogy in Siedlce and institutions involved with environmental protection, discussed the most important problems of environmental protection and indicated directions of activity for the purpose of preventing further degradation of the environment and improvement in the current situation.

Use of Solid State Lasers

In Warsaw on 14 May 1979 was held the scientific and technological conference entitled "Solid State Lasers and Their Application." Taking part in it were scientific workers from the Institute of Microwave and Laser Systems of WAT [Technical Goods Plant] and the "OMEL" Association of the Optical and Medical Equipment Industry, as well as representatives from the Ministry of Higher Education, Science and Technology, the Ministry of the Machine Building Industry, and scientists from scientific research institutions.

In opening the conference, the deputy of the WAT commander for scientific matters, Col Prof Eng Edward Wlodarczyk, briefly recalled the 20-year history of the development of lasers in the world, including Polish developments. Lasers of Polish make are finding more and more areas of practical application. Next Col Docent Zdzislaw Jankiewicz, Dr Eng, presented modern achievements in the area of solid state lasers, especially the accomplishments of the WAT Institute of Microwave and Laser Systems, scarcely 3 years old. In his report Eng Mieczyslaw Gruszczynski emphasized that the period of the past 3 years indicates the real possibilities for the appearance of many developments concerning the practical implementation of lasers in the very near future, since they have already proved to be indispensable instruments providing significant advantages in industry, metrology, medicine and scientific research, as well as in other fields. In ophthalmology alone, more than 35,000 interventions have been made by means of laser instruments in Warsaw alone. It was underscored that holography, used to record information, is a particularly interesting example of laser usage. It is actually possible to store more than 3,000 pages of documents in the A-4 format on a holographic plate 80 x 100 mm in size.

At the end of the conference the participants visited the laboratories of the Institute of Microwave and Laser Systems and became acquainted with the equipment and with the latest laser developments.

Physicochemical Methods of Purifying Water

The Marie Curie-Sklodowska University in Lublin organized an international conference on the subject of physicochemical methods of purifying water and sewage. It was held on 7-9 June 1979 in Lublin with 180 persons participating, scientific workers from our country and from Bulgaria, Czechoslovakia, the United States, Switzerland, Hungary, Great Britain, Italy and the USSR.

The proceedings, consisting of a program of 75 reports, were concentrated on problems of the physicochemical purification of water and sewage, and technical solutions for possibilities of using the same water many times in the productive process and recovering from it materials for repeated production. Here the ideal, as was emphasized, was to develop a full cycle of water and chemicals. Various technologies which can be applied to industrial processes were discussed.

Space Medicine and Biology

Within the framework of "Interkosmos," the 12th Conference and Symposium on the subject of "Space Biology and Medicine" was held in Krakow on 20-22 June 1979. Among others the participants in the talks included the national chairmen of the "Interkosmos" working groups from Bulgaria, Czechoslovakia, Cuba, Mongolia, the GDR, Romania and the USSR, as well as from Poland, the chairman of the PAN Committee on Space Research, PAN regular member Stefan Piotrowski, and the rector of the Jagiellonian University, Prof Mieczyslaw Hess, who opened the conference. Among the guests invited was the first Polish cosmonaut, Lt Col Miroslaw Hermaszewski.

The results of research carried out in orbit by the Polish cosmonaut were also discussed. All experiments concerned a great deal of original and valuable scientific material. In Krakow space biology and medicine have good chances for development, and the achievements of Krakow scientists working under the direction of the dean of the Faculty of Biology and Earth Sciences of Jagiellonian University, Prof Jozef Surowiak, are known not only in our country, but in almost the entire world.

"Interkosmos" Symposium in Warsaw

On 21-23 June 1979 an international symposium on the subject of "The Physics of the Ionosphere, Magnetosphere and Interplanetary Space" was held in Warsaw. Specialists from Poland and from Bulgaria, Czechoslovakia, the GDR, Hungary and the USSR participated in it.

The results of research and experiments carried out by means of satellites in the "Interkosmos" series and geophysical rockets, Soviet satellites of the "Kosmos," "Prognoz" and other types, and phenomena occurring in the near-earth zone of ionizing radiation were discussed, and the results of active experiments in the ionosphere and magnetosphere were presented.

On 25 June-1 July 1976 the "Interkosmos" Working Group on Matters of Space Physics met in Warsaw. The theme of the meeting, in which more than 100 specialists from socialist countries participated, was the phenomena occurring on the sun and in interplanetary space, their effect on the earthly environment, methods of evaluating satellite experiments and space technology.

The meeting was opened by the deputy of the PAN scientific secretary, PAN corresponding member Jerzy Kolodziejczak, who recalled that the conference coincided with the first anniversary celebration in Poland of the flight of the Polish cosmonaut, Lt Col Miroslaw Hermaszewski, as a member of the international crew of the orbiting teams of "Soyuz-29," "Salyut-6" and "Soyuz-30."

As the conference continued general reports were presented dealing with work conducted in each of the countries participating in "Interkosmos." Experimentation was discussed and plans were adopted for further experiments for the purpose of becoming acquainted with the properties of outer space and using them for scientific and practical needs. The results of work in 1978-1979, concerning research on the upper layers of the atmosphere and the magnetosphere of the earth, interplanetary plasma, cosmic radiation, the components of solid interplanetary material, the moon and other planets, short-wave astronomy, the sun and areas beyond the solar system were discussed. Results were also presented: observations of the orbits of the artificial earth satellites for geodetic and geophysical needs, work in the area of building apparatus for space research, processing and analyzing scientific data received, and research on new materials obtained from near-earth space.

At the end of the conference, which was also conducted in nine problem sections, there was discussion and agreement on listing the problems associated with joint experiments and research in the area of space physics, to be conducted in 1981-1985. The PAN deputy chairman, PAN regular member Andrzej Trautman, summarized the discussions and pointed out the role played by research in outer space in the development of modern science, particularly physics.

PAN regular member Stefan Piotrowski, the deputy chairman of the PAN Committee for Space Research, was elected as chairman of the Working Group on Matters of Space Physics for 1979-1980.

Marine Economy

A popular scientific meeting entitled "Marine Economy as a Factor in the Socioeconomic Development of Western Pomerania and the Sphere of International Cooperation in the Baltic Region," was held in Szczecin on 3-5 May 1979. The meeting was organized by the Voivodship Center for Ideological Formation of the PZPR Voivodship Committee and the Western Pomeranian Institute of the WSP [Voivodship Party School] in Szczecin with the cooperation of marine enterprises and institutions.

Representatives of marine economy and scientific workers from our entire coastline and from the interior of the country took part in the session, along with representatives of Szczecin consular posts and foreign specialists, from Bulgaria, Czechoslovakia and the GDR, among others.

The reports presented and the discussions contributed to further integration of the entire coastline and also to further fruitful cooperation, expecially with Czechoslovakia which is very closely associated with the Baltic, although it does not lie on the Baltic. For the first time, as was stressed, an attempt was made to connect the phenomena of socioeconomic life with the social and sociological field of marine economy. Among other subjects discussed were the problem of the effect of the marine economy on social changes in Western Pomerania, an analysis of the vocational community of dockyard workers in the process of change, and the effect of marinization on regional consciousness. It was underscored that the importance of the marine economy is constantly increasing in the country, a result of the many functions it fills and the tightening connections between sea and land. The role of ports, for example, is not merely limited to transshipping goods, but also fulfills important tasks for the deep-sea fishing industry, the shipbuilding industry, passenger traffic and various other branches of our economy. This also refers to fishing which creates opportunities for increasing the national supply of protein from outside our boundaries.

At the end of the conference the participants in the meeting bvisited the port in Swinoujscie.

The Oder as a Transportation Artery

The Voivodship Branch of NOT in Szczecin and the Wroclaw shipowner "Navigation on the Oder," the Association of Inland Navigation in Wroclaw, and the Voivodship branches of NOT in Katowice, Wroclaw, Opole, Zielona Gora, Legnica, Leszno and Gorzow Wielkopolski organized a scientific and technological conference on the subject of the use of the Oder River as a transport artery from Silesia to ports of exit. The conference was held in Swinoujscie on 14-15 May 1979. Both scientific workers and practitioners participated in the conference. Represented were scientific institutions, enterprises working for inland transport and local Oder governments interested in better use of the Oder, both for transport purposes and for agriculture, industry and the community economy of many cities located in the basin of this river.

Many subjects were presented in a dozen or so reports. Along with fundamental problems of maintaining and modernizing the river as a transport artery, interesting concepts in the use of the Oder as a "recreational axis," and the problem of relieving the railroads through inland transport of coal from the black basin were presented.

Problem of Metallic Constructions for the Economy

On 30 May-2 June 1979 the Sixth International Scientific and Technical Conference, devoted to problems of metallic construction, was held in Katowice. The organizers of the conference were the PAN Committee on Land and Water Engineering, the Polish Union of Construction Engineers and Technicians, the Association of "Mostostal" Steel Structures and Industrial Assemblies, and the Silesian Polytechnical Institute. More than 400 specialists participated in the conference, including 52 from abroad, from Czechoslovakia, Holland, the GDR, the FRG, Hungary, the USSR and other countries.

The conference program included six groups of problems corresponding to the following six subject groups: the development of methods to calculate metallic structures; the bearing capacity of elements in metallic structures; research on metallic structures; the metallic structure industry--designing, executing, mounting, directions and prognoses for development; material problems of bonds, connections, and casings in metallic structures; problems of protecting metallic structures from corrosion and fire.

Some 151 reports were presented, 128 of them qualifying for printing. Among other things they concerned exchanges of experimentation and spreading results in the field of research, design and completion of metallic structures in various fields of construction; analysis of all of the scientific, organizational, technological and economic problems associated with the development of steel construction in the current period; present achievements and directions of activity for the immediate future, developmental prognoses, and also the forms which would help the central authorities to make proper decisions concerning the development of the metallic construction branch and the expansion of the necessary potential.

A program report entitled "The State and Prospects for the Development of the Steel Construction Branch" was delivered by the undersecretary of state of the Ministry of Construction and Construction Materials Industry, Stefan Barabach, M Eng.

Mineral Processing

The 13th International Congress on Mineral Processing was held in Warsaw on 4-7 June 1979. Participating in it were specialists from a score of countries on every continent. The best represented were the Soviet Union, Yugoslavia, Czechoslovakia, Great Britain, the FRG and the United States. The chairman of the International Organizational Committee for World Congresses on Mineral Processing, Prof Jacques Astier of France, was also present.

The conference was opened by the deputy minister of Power Industry and Atomic Energy, Tadeusz Zastawnik, who outlined the accomplishments of Poland in the area of the production of mineral resources and in the extraction and export of hard coal, copper and sulphur. The opening address was delivered by the "old man" and teacher of the Polish cadre of specialists in mineral processing, Prof Tadeusz Laskowski, the organizer and first director of the Main Mining Institute and rector of the Silesian Polytechnical Institute for many years.

Next conferences were held in 9 subject sections devoted to the following themes: so-called flotation or the selective process of separating the components of a mixture, which are usually all minerals; milling; hydrometallurgy; new directions in technology; new machinery; optimization and automation; mineral processing with complete utilization of all components; processing wastes and ecology; very small grains in mineral processing.

Automation in the Power Industry

The Institute for Electric Power and Control of PS1 [expansion unknown] Systems in Gliwice, the PAN Committee on Electrotechnology, and the "Energopomiar" in Gliwice organized the Third International Scientific Conference devoted to problems of automation in the power industry. It was held in Gliwice on 7-8 June 1979. Some 350 specialists from Australia, Austria, Czechoslovakia, Egypt, France, India, Canada, Libya, the GDR, Poland, the FRG, Switzerland, Turkey, Great Britain, Italy and the USSR participated in the conference.

During the plenary conference and two thematic groupings concerning automated control of electric power systems and safety automation in the electric power industry, more than 100 reports were delivered. They have been published in a special publication devoted to safe automation of electric power and automated control of electric power systems operation.

International UNIPEDE Congress in Warsaw

The 18th Congress of the International Union of Producers and Distributors of Electrical Energy (UNIPEDE) was held in Warsaw on 11-15 June 1979. Participating in it were approximately 1,600 specialists from 33 countries of Europe and other continents. They discussed problems of power development, nuclear, thermal and water; matters referring to the protection of the natural environment and health protection; prospects for expanding large transcontinental transmission lines; possibilities of computerizing electric power plants and electric energy distribution systems and so on.

UNIPEDE is composed of representatives of institutions from 24 countries associated with power, and their activity embraces problems concerning the development of electric power, its processing, its use and its development.

The chief director of the State Power Distribution, Dr Mieczyslaw Toron, opened the conference emphasizing that a great role in power economy is played by the transmission of electric power on an international, and even continental, scale. In welcoming the guests to the congress, the chairman of the capital city of Warsaw, Jerzy Majewski, recalled among other things that 100 years will have passed in the current year since the use of electric power for lighting purposes for the first time in Warsaw. The thematic address was delivered by the deputy minister Jan Szydlak. Following this an opening report entitled "Energy of the Future" was read, prepared by PAN regular member Pawel Jan Nowacki who died in May, and a collective report of the UNIPEDE executive committee devoted to the role of electricity from the viewpoint of the efficient management of power and its importance in socioeconomic life in the future was also read.

There were also discussions in sections taking up such problems as: problems of nuclear energy, problems in new applications of electricity, matters concerning the collection and use of statistical data respecting power and problems of worker safety and health protection in the power industry, and also the efficient use of all power carriers.

In discussing the development of applications of electricity, it was stated among other things that an essential source of power efficiency may be the distribution of new power equipment, especially the effectiveness of the so-called thermal pumps.

In pursuing the problems of health protection they turned their attention to the effects of shocks from electric current and methods of preventing such incidents, the effect of electrical fields on people, and on methods of working on equipment while it is live, which has a great deal of importance, for example, in making repairs on transmission lines without switching the current off.

At the end of the conference the new UNIPEDE officers were elected. Arnaldo M. Angelini, chairman of the ENEL Italian State Power Enterprise, was chosen chairman of the organization.

The Study Committee for Nuclear Energy presented a special appeal made in the name of UNIPEDE, with the representatives of European energy industries addressing the governments of the individual countries and public opinion, indicating the serious economic consequences which may be suffered by countries in which the construction of nuclear power plants is obstructed. The appeal stated the need for introducing solutions which make it possible to put an end to further delays by making every necessary guarantee of safety.

In a similar spirit letters were formulated and sent to Congress participants by the International Power Agency and the International Atomic Energy Agency.

Preventive Medicine in Animal Production

The Bialystok Branch of the Scientific Society of Organization and Administration and the Institute of Animal Hygiene and Preventive Medicine of the SGGW-AR [Central School of Agriculture-Agricultural Academy] in Warsaw organized a conference on the subject of "Organizational and Technical Conditions" for applying preventive medicine systems to animal production in the North-Eastern macroregion" in Bialystok on 24-26 May 1979.

In addition to scientific workers from Warsaw, Wroclaw, Lublin and Krakow, practitioners also participated in the conference, thus the gmina agricultural service, veterinary physicians, and organizers of animal production in the gminas of this region.

Some dozen reports were delivered referring, among other things, to the use of selenium preparations in watering economic animals, the state and prospects for the development of the production of fodder pre-mixtures and so forth.

Fodder Innovations

The Olsztyn Branch of the Scientific Society of Organization and Administration, with the cooperation of the Agricultural and Technical Academy in Olsztyn, organized an international conference devoted to organizational and technical innovations in the production and preservation of fodder in Olsztyn on 25-26 May 1979. In addition to Polish specialists, scientists from Great Britain, Hungary and the USSR participated in the conference.

Among other things they spoke of the preservation of damp grain, silage and hay with chemical preservative additives, about the technology of root-crops as a way of increasing the amount of good fodder with various additives, including crushed rape, and about the importance in industrial production of feeding cattle homogeneous food, based on hay and silage and on pressed, dry fodder (briquets made of green fodder and grain). Proposals were also made, for example, from the viewpoint of frequent unfavorable weather conditions, to use the heat generated by green fodder to dry it. Methods of preserving grain with a low oxygen content, low temperature and reduced humidity, and also a way of using refrigeration to preserve agricultural products were mentioned, along with information on the most modern equipment for drying fodder, the possibility of installing it and so forth.

Use of Nitrogen in Field Crops

On the initiative of the Agricultural Academy in Poznan and the Association of Agricultural Enterprises in Zielona Gora, a scientific and technological conference was held in Lagowo on 23 May 1979 on the subject of using large doses of nitrogen in field crops.

Representatives of the University named for Martin Luther in Halle who participated in the conference spoke, among other things, on the possibilities of efficient use of nitrogen in grain crops and the complementary action of natural fertilizers used in clayey soils. Scientists from the Poznan AR [Agricultural Academy] presented the results of their research in this field. Prof Zbyszko Tucholka discussed the effect of large doses of nitrogen on the biological content of protein in cereal grains.

Improved Breeding of Milk Cattle

The Main School of Rural Economy of the AR in Warsaw and the PAN Institute of Animal Genetics and Breeding in Jastrzebiec organized an international symposium on the use of the Holstein-Friesian breed for improving the milk characteristics of cattle. It was held in Warsaw on 4-9 June 1979.

Scientists from the socialist countries, representatives of the United States from scientific laboratories interested in this problem and from the Association of Holstein-Friesian cattle breeders participated in the symposium. At the present time the Holstein-Friesian cattle breed is used throughout the world for crossing with local breeds of animals for the purpose of increasing their milk capacity. In cooperation with the FAO [Food and Agricultural Organization] Poland is conducting a large-scale experiment on 30,000 cows.

During the Warsaw symposium current results were presented in the field of improving milk cattle breeding, experiments in this area were mentioned, and the directions for further cooperation were set.

Intensification of Cattle Breeding

The Institute of Animal Technology in Krakow, the Scientific and Technical Association of Agricultural Engineers and Technicians in Lodz and the Voivodship Center for Agricultural Progress in Bartoszewice organized a scientific conference on the subject of cattle breeding intensification. It was held in Lodz on 18 June 1979. In addition to scientific workers from Krakow, participants in the conference included engineering and technological workers from the Lodz City Voivodship, the Piotrkow Trybunalski, Sieradz and Skierniewice Voivodships, and a dozen or so practitioners who are farmers in the Lodz region.

They evaluated the current state and perspectives of cattle breeding development under the agricultural conditions of the Lodz City Voivodship. They stressed the need for comprehensive activity in the area of cattle breeding intensification both in the Lodz region and in the neighboring voivodships, and presented many practical conclusions for application by farmers. They referred to modern principles of fodder base organization on peasant farms, effective feeding of milk cows, benefits from the best genetically verified stock under current conditions in cattle breeding, economic justifications for milk production and so forth.

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POLAND

BRIEFS

NEW COMPUTER CENTER--A computer computation establishment [ZETO] was put into operation in Lomza on 26 November 1979. This establishment is equipped with an ODRA 1304 digital computer. The computational capacity of this installed computer is more than 430 operating hours per month. [Excerpt] [Bialystok GAZETA WSPOLCZESNA in Polish 27 Nov 79 pp 1, 2]

ROBOTRON 4201 INSTALLATION--The first ROBOTRON 4201 minicomputer system in Poland was installed at the "Elektromontaz" Association [Construction Industry Electrical Equipment Production and Erection Association, Warsaw] at the end of 1977. [Excerpt] [Warsaw INFORMATYKA in Polish No 12, Dec 79 pp 34-35]

R-32 COMPUTER INSTALLATION--In regard to mechanization of the Central Office of Statistics [GUS], a R-32 computer was installed, as the first unit of this type, in the GUS Electronic Center in Warsaw in December, 1976. [Excerpt] [Warsaw WIADOMOSCI STATYSTYCZNE in Polish No 1, Jan 80 pp 38-42]

CONSTRUCTION INDUSTRY COMPUTER INSTALLATIONS--The nearest [to Bielsko-Biala] construction industry electronic computer computation center [ETOB]--in Katowice--has only a MINSK 32 and R-32 computer. The installation of an ODRA computer here is not envisaged. At the end of 1977, the ETOB leased room space, and an ODRA 1305 computer (having the configuration customarily designated by the primary supplier) was installed; and in January, 1979, the Computer Center of the Katowice Computer Science Enterprise of the Construction Industry ETOB, with its headquarters in Bielsko-Biala, was officially established. [Excerpt] [Warsaw INFORMATYKA in Polish No 10, Oct 79 p 33]

ODRA 1305 COMPUTER INSTALLATION--A modern, new building of the construction industry electronic computer computation [ETOB] establishment on Legnicka Street [in Wroclaw], in which its initial ODRA 1305 computer was installed, was opened at the beginning of 1976. A year later the Wroclaw establishment became subordinate to the ETOB enterprise in Katowice. Subsequently, Engineer Bartlomiej Kruszelnicki, a former ELWRO enterprise employee, soon became the new director of the establishment which acquired another ODRA 1305 computer. [Excerpt] [Warsaw INFORMATYKA in Polish No 10, Oct 79 p 34]

MERA 305 COMPUTER INSTALLATION--The computer is being used, to an increasingly greater extent, to control the technological process at the "Konin" aluminum plant. A MERA 305 computer, which is currently operating there, is collecting information from each electrolyzer. [Excerpt] [Warsaw ZYCIE GOSPODARCZE in Polish No 12, 23 Mar 80 p 14]

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